

GESTATIONAL DIABETES AND ITS INFLUENCE ON THE QUALITY OF LIFE OF PREGNANT WOMEN

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ABSTRACT

Introduction: Diabetes is the most common metabolic complication encountered during pregnancy. It usually subsides following the delivery, yet at the same time it constitutes a risk factor for the development of manifest diabetes later in life. The assessment of the quality of life of women suffering from gestational diabetes is aimed at gaining information on various areas of their functioning and the evaluation of the recommendations concerning care over and education of such patients.

Aim of the study: To assess the quality of life of women with gestational diabetes.

Material and methods: The study was conducted between 15 January 2016 and 23 March 2016 in the Department of Obstetrics and Perinatology of the University Hospital in Krakow and in the Diabetology Clinic for Pregnant Women at the Department of Metabolic Diseases of the University Hospital in Krakow. Eighty-seven women suffering from diagnosed gestational diabetes formed the study group, of which 47 were treated with diet and 40 with diet and insulin. The diagnostic survey method was applied in the research. A SF-36v2 standardised questionnaire as well as a questionnaire prepared by the researcher were used to assess the quality of life.

Results: Most of the examined women assessed their life quality as good. The assessment of the quality of life varied depending on the type of therapy they received for gestational diabetes. A statistically significant difference with respect to social functioning (SF) was determined between the women treated with diet and insulin, and women treated exclusively with diet. Education and the value of BMI (body mass index) before pregnancy were factors affecting selected dimensions of the quality of life.

Conclusions: The treatment method and, to a minor extent, some socio-demographic factors belong to the factors that may be considered prognostic for the quality of life in women suffering from gestational diabetes.

Key words: pregnancy, quality of life, gestational diabetes mellitus, SF-36v2.

INTRODUCTION

Diabetes is a chronic disease that is considered as a civilisational and social one. It involves numerous complications. As a result, a diabetic patient's quality of life should be perceived from a wide perspective. Diabetes is also the most frequently occurring metabolic complication of endocrinological nature occurring during pregnancy. In Europe, gestational diabetes occurs in between 3 and 5% of pregnant women [1]. According to the Polish Diabetological Association, diabetes appearing in the course of

pregnancy is divided into: hyperglycemia diagnosed for the first time during pregnancy and diabetes preceding pregnancy (pregestational diabetes mellitus – PGDM). Both diabetes during pregnancy and gestational diabetes mean an impaired glucose tolerance of various degree diagnosed for the first time during pregnancy [2]. Diabetes during pregnancy is diagnosed when fasting glycaemia is ≥ 7.0 mmol/l (126 mg/dl) or in case of abnormal OGTT result (at 2 hours 75 g OGTT ≥ 11.1 mmol/l) or when random blood glucose level is ≥ 11.1 mmol/l (200 mg/dl)

and it is associated with clinical symptoms of hyperglycemia [3].

The criterion for diagnosing gestational diabetes is at least one abnormal result out of three of the following plasma glucose tests with 75 g glucose (OGTT):

- fasting 92-125 mg/dl (5.1-6.9 mmol/l),
- at 60 minutes ≥ 180 mg/dl (≥ 10.0 mmol/l),
- at 120 minutes 153-199 mg/dl (8.5-11.0 mmol/l) [3].

We differentiate between two types of diabetes: in G1 gestational diabetes women must adhere to diabetic diet therapy in order to keep a normal blood sugar level, while in G2 gestational diabetes both following diabetic diet and insulin therapy are necessary [4]. Pregestational diabetes is defined as a disorder affecting pregnant women in whom the disease was diagnosed before pregnancy. It may be type 1 or 2, MODY or any other kind of diabetes [4-6].

In accordance with the guidelines of the Polish Diabetological Association (2017 guidelines), the risk factors for developing hyperglycemia in pregnancy include the following [3]:

- pluriparity,
- pregnancy after 35 years of age,
- delivering a newborn with a birth defect,
- history of intrauterine deaths,
- history of delivering heavy babies (> 4000 g),
- hypertension,
- being overweight or obese,
- family history of type 2 diabetes,
- gestational diabetes diagnosed during previous pregnancies,
- polycystic ovarian syndrome.

The Polish Diabetological Association's recommendations of 2017 [3] define the criteria for the diagnosis and classification of hyperglycemia diagnosed for the first time during pregnancy. All pregnant women should be screened for glucose tolerance impairment and the initial determination of fasting glucose should be performed during the first visit to the gynaecologist during the first trimester of pregnancy. In pregnant women at risk, 75 g Oral Glucose Tolerance Test (OGTT) should be performed then. The normal result of the initial fasting glucose test is < 92 mg/dl.

In cases when the level of glucose:

- amounts to 92-125 mg/dl – 75 g OGTT should be performed urgently,
- exceeds 125 mg/dl – fasting glucose test should be repeated urgently.

When the result of repeated fasting glucose test is abnormal, the patient should be referred to a centre treating diabetic complications in pregnancy [3]. Random fasting glycemia in the first trimester exceeding 92 but below 125 mg/dl does not constitute a basis for the diagnosis of gestational diabetes [3]. Diagnosis with the use of OGTT should be performed

in all pregnant women between 24th and 28th week of pregnancy [3, 7]. Oral load of 75 g glucose is used, dissolved in 250-300 ml of water and drunk within 5 minutes. In the case of abnormal result, the obstetrician together with a diabetologist should determine the course of treatment, aiming at preventing complications in the mother and the foetus [8].

Integrated and multidisciplinary approach is necessary in the care of diabetic pregnant woman. What is important is education, carried out by a midwife or a nurse from a diabetology clinic, concerning the clinical issues, the technical aspects of managing the insulin pump, the administration of medicines and independent glycemia testing. Also, education concerning physical activity and breastfeeding is an important aspect here [3]. In the course of diabetes, strict adherence to dietary recommendations, and regular independent monitoring of glycemia are necessary. Maximum glycemia within 1 hour after starting a meal should be below 140 mg/dl (< 7.8 mmol/l) and the target values of self-control while fasting should range between 70 and 90 mg/dl (3.9-5.0 mmol/l) [3]. What is also significant is the evaluation of the pregnant woman's assessment of the quality of life because it indicates the effects of using various medical procedures [9]. It is the state of health, in combination with other domains, such as mental and emotional health or social functioning, which comprise the subjective assessment of a patient's quality of life [9, 10].

AIM OF THE STUDY

The aim of the study was to learn about the subjective assessment of the quality of life by women with gestational diabetes treated with diet and diet combined with insulin, as well as the factors affecting it.

MATERIAL AND METHODS

The study was conducted in the Department of Obstetrics and Perinatology of the University Hospital in Kraków and in the Diabetology Clinic for Pregnant Women at the Department of Metabolic Diseases of the University Hospital in Kraków, on 99 pregnant women in whom gestational diabetes was diagnosed in the period between January and March 2016. Following the initial analysis of the questionnaires, only 87 of them were used in the study. The remaining questionnaires were rejected due to the incompleteness of the answers provided by the patients. In the studied group, 40 women were treated with diet and insulin while 47 used dietary treatment. The study fulfilled the requirements of the Declaration of Helsinki. The participation was voluntary and the respondents had been informed about its anonymity and the possibility to resign at any stage of its course.

In the study, the method of the diagnostic survey with a questionnaire were employed. Two questionnaires were the tools of the study. Standardised questionnaire for the quality of life SF-36v2 (Quality of life SF-36v2) was used, for which the permission was obtained from Optum company from the USA (licence number: QM031593), as well as the author's questionnaire.

SF-36v2 questionnaire consists of 11 questions with a total of 36 statements that enable the assessment of eight dimensions of the quality of life, such as PF – Physical functioning, RP – Role limitations due to physical health problems, BP – Body pain, GH – General health perception, RE – Role limitations due to emotional problems, SF – Social functioning, MH – General mental health and VT – Vitality. Dimensions of life quality are attributed to two scales: physical (PCS – Physical Component Summary) which includes PF, RP, BP and GH, and mental (MCS – Mental Component Summary) which comprises RE, SF, MH and VT. The results obtained in terms of PF, RP, BP, GH, RE, SF, VT, MH are demonstrated in the scale 0-100, where the higher the result, the better the assessment of life quality in a given dimension. The norm-based scale is used to assess results in physical and mental spheres, in which the norm is determined by any result equalling 50. The value below 50 means worse quality of life associated with health and a higher result denotes a better quality of life [9, 10].

The author's questionnaire consisted of 27 questions concerning, among others, socio-demographic data, the course of the present pregnancy, obstetric history, the pregnant woman's diseases, cases of diabetes in the family and treating gestational diabetes.

The Health Outcomes Scoring Software 4.5 was used to analyse the data from the SF-36v2 question-

naire. The data collected were entered into the Microsoft Office Excel 2010 data sheet. Statistica 12 was then used for statistical analysis. The values of arithmetic mean, standard deviation, median, minimum and maximum were calculated. In order to assess the differences between the groups, the nonparametric Mann-Whitney U test was used. The relationship between selected variables and the dimensions of quality of life was tested by means of Spearman's rank correlation. $\alpha = 0.05$ was accepted as the level of significance of differences between the groups tested.

RESULTS

The average age of women in both groups was similar and amounted to about 30.97 ± 3.47 years in the group of pregnant women treated with insulin and 30.62 ± 4.73 years among subjects treated with diet only. Most of the pregnant women were married (81.61%, $n = 71$) and had received higher-education (66.67%, $n = 58$). The largest group of respondents lived in cities of a population of more than 100 thousand (42.53%, $n = 37$).

15% ($n = 6$) of women treated with insulin and 38.3% ($n = 18$) of women treated with diet were pregnant for the first time. In the group of pregnant women treated with insulin, gestational diabetes occurred in the previous pregnancy in 30% ($n = 12$) of the respondents. 40% ($n = 16$) of them experienced at least one miscarriage and 42.5% ($n = 17$) delivered a baby whose weight exceeded 4000 g, which was about twice as much as in the case of women treated with diet only (14.89%, $n = 7$; 23.4%, $n = 11$ and 19.4%, $n = 12$; Table 1).

Table 1. Specification of the tested group

No.		Women with gestational diabetes treated with diet and insulin ($n = 40$)		Women with gestational diabetes treated with diet ($n = 47$)	
		<i>n</i>	%	<i>n</i>	%
1. Pregnancy	I	6	15	18	38.30
	II	19	47.5	23	48.94
	III	13	32.5	5	10.64
	IV	2	5	1	2.13
2. Gestational diabetes during the previous pregnancy		12	30	7	14.89
3. Miscarriages		16	40	11	23.4
4. Keeping a diet		40	100	45	95.74
5. Not performing glycemia measurements		0	0	1	2.13
6. Performing measurements once a day		1	2.5	2	4.26
7. Performing measurements more than once a day		39	97.5	44	93.62
8. Keeping a self-test diary		40	100	45	95.74

n – number of women; % – percentage

Table 2. The quality of life of pregnant women depending on the method of gestational diabetes treatment

Dimensions of life quality	Women with gestational diabetes treated with diet and insulin (n = 40)		Women with gestational diabetes treated with diet (n = 47)		Mann-Whitney U test <i>p</i>
	<i>X</i> ±SD	ME (min – max)	<i>X</i> ±SD	ME (min – max)	
PF	59.5±25.77	67.5 (5–95)	63.3 ±24.1	70 (0–95)	0.4849
RP	43.13 ±23.89	43.75 (0–100)	54.12 ±29.78	50 (0–100)	0.0658
BP	62.25 ±18.95	62 (31–100)	68.68 ±20.41	64 (31–100)	0.1854
GH	62.15 ±16.39	61 (37–92)	65.6±19.81	67 (30–92)	0.4063
VT	50.63 ±16.73	50(6.25–81.25)	55.19 ±14.65	62.5 (25–75)	0.1599
SF	53.75 ±23.72	50 (12.5–100)	69.15 ±24.15	75 (0–100)	0.0040
RE	73.96 ±33.82	91.67 (0–100)	79.61 ±25.94	91.67 (0–100)	0.5202
MH	45.18 ±6.88	65 (35–80)	69.36 ±17.43	70 (30–100)	0.1477
PCS	42.53 ±6.1	43.04 (28.47–55.08)	44.72 ±6.97	44.29 (31.14–57.63)	0.1477
MCS	45.69 ±10.31	51.26 (25.44–56.74)	49.11 ±8.71	51.07 (26.55–61.32)	0.1181

n – number of women; *X* – arithmetic mean; *SD* – standard deviation; *ME* – median; *min* – minimum; *max* – maximum; *p* – significance level; *PF* – Physical functioning; *RP* – Role limitations due to physical health problems; *BP* – Body pain; *GH* – General health perception; *RE* – Role limitations due to emotional problems; *VT* – Vitality, energy or fatigue; *SF* – Social functioning; *MH* – General mental health; *PCS* – Physical Component Summary; *MCS* – Mental Component Summary

The women studied were characterised by a very high level of self-discipline and diabetes monitoring. In the group treated with insulin, all the respondents (100%, *n* = 40) adhered to the diet and kept a self-control diary. Almost all of them measured their glycemia at least twice a day (97.5%, *n* = 39). Among the women treated with diet, only two did not follow the diet and did not keep self-control diary (4.26%) while one did not make glycemia measurements (2.13%; Table 1).

Table 3. The quality of life of pregnant women depending on age

Dimensions of life quality	Age			
	Women with gestational diabetes treated with diet and insulin (n = 40)		Women with gestational diabetes treated with diet (n = 47)	
	<i>R</i>	<i>p</i>	<i>R</i>	<i>p</i>
PF	–0.42	0.0076	–0.15	0.3285
RP	0.10	0.5414	0.01	0.9604
BP	0.06	0.7177	0.12	0.4352
GH	–0.05	0.7610	–0.22	0.1453
VT	0.25	0.1207	–0.25	0.0853
SF	–0.16	0.3100	–0.22	0.1396
RE	0.18	0.2596	–0.23	0.1230
MH	0.18	0.2694	–0.22	0.1360
PCS	–0.34	0.0333	0.01	0.9457
MCS	0.17	0.2830	–0.31	0.0347

p – significance level; *R* – Spearman's rank correlation coefficient; *PF* – Physical functioning; *RP* – Role limitations due to physical health problems; *BP* – Body pain; *GH* – General health perception; *RE* – Role limitations due to emotional problems; *VT* – Vitality, energy or fatigue; *SF* – Social functioning; *MH* – General mental health; *PCS* – Physical Component Summary; *MCS* – Mental Component Summary

Women taking insulin had greater average body weight (72.73 kg, *p* = 0.0280) and greater BMI before pregnancy (26.72 kg/m², *p* = 0.0041). They also more frequently had abnormal body weight (62.5%, *n* = 25) in comparison with those treated with diet (65.09 kg, 23.8 kg/m² and 42.55%, *n* = 20) during pregnancy.

Women treated with diet obtained statistically significant higher average result with respect to the dimension of social functioning factor (*SF* = 69.15) in comparison with those treated with insulin (*SF* = 53.75). The remaining differences between the groups were not statistically significant. In both groups, limitations arising out of *RE* emotional problems turned out to be the best assessed dimension of life quality (73.96 in the group taking insulin, 79.61 in the group treated with diet only). Limitations caused by problems with physical health, in turn, were the area of life quality that had the lowest evaluation by respondents taking insulin (*RP* = 43.13) and by respondents treated with a diet only (*RP* = 54.12), but the average result in the group of pregnant women who took insulin was lower by 10.99 (Table 2).

In the subsequent part of the analysis, it was checked whether such variables as age, education, BMI value from before pregnancy and the increase in body weight during pregnancy influenced the results of particular elements of the SF-36v2 questionnaire. It was demonstrated that younger women taking insulin exhibited better physical functioning *PF* (*R* = –0.42, *p* = 0.0076) and the general results on the physical condition scale *PCS* (*R* = –0.34, *p* = 0.0333). Younger pregnant women treated with diet only had higher results in the general mental condition scale *MCS* (*R* = –0.31, *p* = 0.0347; Table 3).

Table 4. The quality of life of pregnant women depending on education

Dimensions of life quality	Education			
	Women with gestational diabetes treated with diet and insulin (n = 40)		Women with gestational diabetes treated with diet (n = 47)	
	R	p	R	p
PF	-0.38	0.0143	-0.16	0.2684
RP	-0.19	0.2432	-0.19	0.1927
BP	0.31	0.0547	-0.17	0.2451
GH	0.21	0.1859	-0.19	0.1997
VT	0.38	0.0146	-0.01	0.9726
SF	-0.01	0.9476	-0.09	0.5596
RE	0.42	0.0066	-0.33	0.0216
MH	0.38	0.0158	-0.26	0.0813
PCS	-0.41	0.0079	-0.15	0.3282
MCS	0.38	0.0163	-0.19	0.1923

p – significance level; R – Spearman's rank correlation coefficient; PF – Physical functioning; RP – Role limitations due to physical health problems; BP – Body pain; GH – General health perception; RE – Role limitations due to emotional problems; VT – Vitality, energy or fatigue; SF – Social functioning; MH – General mental health; PCS – Physical Component Summary; MCS – Mental Component Summary

In the group of pregnant women taking insulin, numerous correlations were found between the dimensions of the quality of life and the level of education. Higher level of education in women treated with diet resulted in greater limitations in fulfilling roles, resulting from emotional problems RE ($R = -0.33$, $p = 0.0216$), while in the group of pregnant women taking insulin the situation was the opposite ($R = 0.42$, $p = 0.0066$; Table 4).

In the group of respondents who were treated with diet only it was proven that those with a higher BMI before pregnancy were characterised by lesser pain complaints BP ($R = 0.36$, $p = 0.0120$), better social functioning SF ($R = 0.61$, $p \leq 0.0001$) and lower limitation in performing roles resulting from emotional problems RE ($R = 0.61$, $p \leq 0.0001$; Table 5).

Weight gain during pregnancy, in turn, correlated negatively with physical functioning PF ($R = -0.31$, $p = 0.0322$) and limitations in performing roles due to physical health (Role-Physical) RP ($R = -0.33$, $p = 0.0258$) in the group of pregnant women treated with diet and physical functioning PF ($R = -0.31$, $p = 0.0493$) in women taking insulin (Table 6).

DISCUSSION

The analysis of individual components of the SF-36v2 form in both examined groups did not show statistically significant differences between any single health quality dimension except for social functioning SF. The pregnant women treated with diet obtained

Table 5. The quality of life of pregnant women depending on BMI before the pregnancy

Dimensions of life quality	BMI			
	Women with gestational diabetes treated with diet and insulin (n = 40)		Women with gestational diabetes treated with diet (n = 47)	
	R	p	R	p
PF	0.21	0.1910	0.18	0.2390
RP	0.10	0.5568	0.28	0.0588
BP	0.29	0.0652	0.36	0.0120
GH	0.26	0.1021	0.16	0.2878
VT	0.08	0.6072	0.19	0.2112
SF	0.10	0.5575	0.37	0.0107
RE	0.09	0.5801	0.61	< 0.0001
MH	0.08	0.6278	0.16	0.2965
PCS	0.41	0.0084	0.23	0.1226
MCS	0.04	0.7856	0.38	0.0085

p – significance level; R – Spearman's rank correlation coefficient; PF – Physical functioning; RP – Role limitations due to physical health problems; BP – Body pain; GH – General health perception; RE – Role limitations due to emotional problems; VT – Vitality, energy or fatigue; SF – Social functioning; MH – General mental health; PCS – Physical Component Summary; MCS – Mental Component Summary

Table 6. The quality of life of pregnant women depending on the weight gain during pregnancy

Dimensions of life quality	Weight gain			
	Women with gestational diabetes treated with diet and insulin (n = 40)		Women with gestational diabetes treated with diet (n = 47)	
	R	p	R	p
PF	-0.31	0.0493	-0.31	0.0322
RP	-0.07	0.6874	-0.33	0.0258
BP	0.30	0.0621	-0.28	0.0527
GH	0.02	0.9012	-0.10	0.5089
VT	-0.14	0.3761	-0.20	0.1697
SF	0.03	0.8393	-0.27	0.0625
RE	-0.11	0.5184	-0.19	0.2119
MH	0.03	0.8319	-0.27	0.0632
PCS	-0.24	0.1369	-0.40	0.0057
MCS	-0.02	0.8868	-0.24	0.0993

p – significance level; R – Spearman's rank correlation coefficient; PF – Physical functioning; RP – Role limitations due to physical health problems; BP – Body pain; GH – General health perception; RE – Role limitations due to emotional problems; VT – Vitality, energy or fatigue; SF – Social functioning; MH – General mental health; PCS – Physical Component Summary; MCS – Mental Component Summary

statistically significant higher quality of life in comparison to those taking insulin ($p = 0.004$). This may mean that the need of taking additional insulin affects the lower quality of life in terms of social functioning. Bień *et al.* came to similar conclusions in their study.

The researcher showed that women with gestational diabetes treated with diet assessed their quality of life higher than did those taking insulin [11]. This is confirmed by the study of Kutowska *et al.*, who determined the deterioration of the quality of life of pregnant women following the diagnosis of gestational diabetes and the initiation of insulin therapy [12]. The lowest values of life quality in both groups were noted in the category of limitation due to physical health RP, where the average value in the group of pregnant women treated with insulin was lower and amounted to 43.13. The examined pregnant women from both groups assessed the RE dimension at the highest level, the average value for women taking insulin was 73.96 and for those treated with diet only 79.61. This means that women suffering from gestational diabetes did not experience emotional problems in their daily functioning, irrespective of the treatment used. The average results on the overall physical condition scale of PCS and mental condition scale MCS were below normal in both groups; the differences were not statistically significant. These results coincide with the results obtained by Truntovsky *et al.* who demonstrated in their study that the general evaluation of the quality of life of women with gestational diabetes decreased with progress in pregnancy, regardless of the kind of treatment used [13]. In the study carried out by Dalfrà *et al.*, respondents with gestational diabetes noted lower results in the dimension of general health perception GH and higher results in the physical scale PCS in comparison to the group of pregnant women [14]. Kim *et al.* came to other conclusions on the influence of gestational diabetes on the quality of life. They proved the absence of significant influence of the disease on the deterioration in women's life quality [15]. Similar results were also obtained by Halkoaho *et al.* who did not prove the impact of gestational diabetes in the examined women on the decrease of life quality as perceived by them [16].

Our own research analysed the influence of age, education, BMI from the pre-pregnancy period and weight gain during pregnancy on the assessed quality of life. It was demonstrated that age negatively correlated with physical functioning PF and the results on the overall physical condition scale PCS in women treated with insulin, which is confirmed by the studies by Glasgow *et al.* [17]. Majda *et al.* came to similar conclusions in their study. When assessing their quality of life by means of WHOQOL-Bref Life Quality Questionnaire, younger women with gestational diabetes obtained higher results in the psychological sphere as well as in the social one [18].

In the studies of Nowakowska-Głąb and Maniecka-Bryła, statistically significant differences were found between the assessment of the quality of life of pregnant women and their level of education. Respond-

ents with higher education obtained higher results in indicators of perceived mental health MH and their perceived general health GH [19]. We found confirmation of this in our own research, in which we demonstrated that the level of education correlates positively with the sense of mental health MH ($R = 0.38$, $p = 0.0163$).

When analysing the impact of BMI from the pre-pregnancy period on the assessment of the quality of life, it was determined that it correlated positively with some indicators, which suggests that women with a higher BMI were characterised by a better quality of life. In turn, weight gain during pregnancy negatively correlated with such indicators as physical functioning PF, limitation in performing roles due to physical health issues (Role-Physical) RP and the results obtained on the overall physical condition scale PCS in pregnant women treated with diet and with physical functioning PF in the respondents taking insulin. This means that lower weight gain during pregnancy was conducive to better assessment of the quality of life.

CONCLUSIONS

1. The subjective assessment of the quality of life of the pregnant women with gestational diabetes was good.
2. The use of insulin in the treatment of gestational diabetes may have an influence on lower subjective evaluation of the quality of life.
3. The kind of therapy of gestational diabetes has the greatest influence on the social functioning SF, pregnant women treated with diet only evaluate better this dimension of life quality.
4. Sociodemographic factors such as age, education, pre-pregnancy BMI value and weight gain during pregnancy had an impact on the results obtained by the respondents in particular dimensions of the quality of life.
5. Medical staff should take special care of women with gestational diabetes treated with insulin due to the negative influence of the applied method of treatment on quality of life.

Disclosure

The authors declare no conflict of interest.

References

1. Standardy Polskiego Towarzystwa Ginekologicznego postępowania u kobiet z cukrzycą – aktualizacja. *Ginekol Pol* 2014; 85: 476-478.
2. Gibała M, Janowski G. Cukrzyca w ciąży. *Położna Nauka i Praktyka* 2016; 1: 50-55.
3. 2017 Guidelines on the management of diabetic patients. A position of Diabetes Poland. *Clin Diabet* 2017; 6 Suppl. A: A1-A80.

4. Tarwacka J, Niebisz-Cieślak A. Cukrzyca u kobiet w okresie ciąży. *Nowa Klinika. Diabetologia, Gastroenterologia, Otyłość* 2011; 18: 20-27.
5. Wałęskiewicz K, Rajewski P, Kolesińska-Konkel N, et al. Cukrzyca a ciąża. *Fam Med Prim Care Rev* 2011; 13: 623-628.
6. Pawlik D, Radziszewska R. Cukrzyca u matki i jej konsekwencje dla dziecka. *Endykronol Ped* 2015; 14: 43-51.
7. Standardy Polskiego Towarzystwa Ginekologicznego postępowania u kobiet z cukrzycą. *Ginekol Pol* 2011; 82: 474-479.
8. Stupak A, Kwaśniewska A, Kwaśniewski W. Cukrzyca ciążowa – aktualne kierunki w opiece perinatologicznej. *Diabetol Dypl Medical Tribune* 2015; 12: 28-31.
9. Turska W, Skowron A. Metodyka oceny jakości życia. *Farm Pol* 2009; 65: 572-580.
10. Tylka J, Piotrowicz R. Kwestionariusz oceny jakości życia SF-36 – wersja polska. *Kardiolog* 2009; 67: 1166-1169.
11. Bień A, Rzońca E, Kańczugowska A, et al. Factors affecting the quality of life and the illness acceptance of pregnant women with diabetes. *Int J Environ Res Public Health* 2016; 13: 1-13.
12. Kutowska J, Gierszewska M, Mieczkowska E, et al. Quality of life among women with gestational diabetes mellitus. *Med Biol Sci* 2012; 26: 133-138.
13. Trutnovsky G, Panzitt T, Magnet E, et al. Gestational diabetes: women's concerns, mood state, quality of life and treatment satisfaction. *J Matern Fetal Neonatal Med* 2012; 25: 2464-2466.
14. Dalfrà MG, Nicolucci A, Bisson T, et al. QLISG (Quality of Life Italian Study Group): Quality of life in pregnancy and postpartum: a study in diabetic patients. *Qual Life Res* 2012; 21: 291-298.
15. Kim C, Brawarsky P, Jackson RA, et al. Changes in Health Status Experienced by Women with Gestational Diabetes and Pregnancy-Induced Hypertensive Disorders. *J Womens Health (Larchmt)* 2005; 14: 729-736.
16. Halkoaho A, Kavilo M, Pietilä AM, et al. Does gestational diabetes affect women's health-related quality of life after delivery? *Eur J Obstet Gynecol Reprod Biol* 2010; 148: 40-43.
17. Glasgow RE, Ruggiero L, Eakin EG, et al. Quality of life and associated characteristics in a large national sample of adults with diabetes. *Diabetes Care* 1997; 20: 562-567.
18. Majda A, Walas K, Samoiluk O. Jakość życia kobiet z cukrzycą ciążową. *Probl Pielęg* 2014; 22: 459-463.
19. Nowakowska-Głąb A, Maniecka-Bryła I. Zależność między wykonywaną pracą a jakością życia związaną ze zdrowiem kobiet ciężarnych. *Medycyna Pracy* 2011; 62: 601-607.